Space Weather Forecast

Issued on Thursday, 08 September 2022 at 13:08 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Now-reduced Slight Chance of further G1/Minor Geomagnetic Storms at first.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was low over the past 24 hours, with X-ray activity subdued, with isolated peaks into the bottom end of common class. The largest of these flares was observed at 08/0937UTC, which appeared to emanate from an as yet unnumbered sunspot in the northeast. This was one of up to six sunspot regions on the Sun at present. The most noteworthy of these sunspot groups in terms of its complexity on paper is a larger region nearer the northeastern solar horizon, which currently manifests as a magnetically bipolar group, with slight growth in its trailing spot and minor proliferation of its intermediate regions. Also of note were the flaring unnumbered region which grew slightly by the period's end. The other regions on the Sun all showed stable or decaying trends and were unproductive.

An apparently minor 'disappearing filament' (arc of plasma potentially lifting from the Sun) was observed from the south-central portion of the facing side shortly before the 24-hour period began - at around 07/1100UTC. There is not currently any triangulating satellite imagery available, but ejecta seen via other sources appears to suggest a weak and slow Coronal Mass Ejection (CME) heading largely below the plane of the Earth's orbit. This will be confirmed or adjusted in coming guidance.

No other potentially Earth-directed CMEs were in evidence.

Solar Wind / Geomagnetic Activity: The solar wind was indicative of a slowly waning fast regime from a 'coronal hole'. Wind speeds remained elevated but fell through the full scope of this designation in the period (i.e. from top-end to low). The number of particles and their associated magnetic field were both unremarkable, other than the fact that the field vector spent protracted periods either co or anti-aligned with Earth's field - to lesser or greater geomagnetic effect respectively.

The net result of the above geomagnetic activity was a peak of Minor Storm G1 in the 06-09UTC interval.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be largely low, with a slight chance of becoming moderate with isolated Moderate-class flares, most likely from the large region near the northeastern solar horizon.

Solar Wind / Geomagnetic Activity: No Earth-directed CMEs are currently in the forecast.

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Solar winds continue to be elevated from the waning effects of a fast wind fronm a coronal hole. Wind speeds are expected to ease somewhat over the coming days, however a weaker coronal hole in the northwest may give a continuation of elevated, likely easing to slightly elevated, wind speeds through this period. Confidence in this is lower than average.

Geomagnetic activity carries a slight chance of G1/Minor Storm intervals on Day 1 (08 Sep). This should slowly ease through the period to become largely quiet by Day 3 (10 Sep).

Energetic Particles / Solar Radiation: No solar radiation storms are expected given the dearth of significant regions and flares.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	20	5	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	10	10	10	10
Very Active	R3 to R5 X	No	1	1	1	1

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Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	1	1	2	2
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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